NOTE XIII.

LIST OF THE SPECIMENS OF SQUIRRELS IN THE LEYDEN MUSEUM.

BY

Dr. F. A. JENTINK.

February 1883.

AMERICAN SQUIRRELS.

The profound and extensive studies upon the American Squirrels by Allen [1]) and Alston [2]), have made this group, we must confess it, one of the best known among the Mammals. At the same time however the named authors have shown that it is almost an impossibility to give a good and exact diagnosis of an American Squirrel, because the specimens of a given species differ, so to say, infinitely in the hairiness of the ears, which are tufted or not tufted, in the length and strength of the body, a. s. o. The difficulty increases as these variations are to be found not constantly in individuals from different localities, but as they often are present in individuals from the same locality and gathered on the same day or in the same season.

---

[1]) Monographs of North American Rodentia. N°. XI. Sciuridae. 1877. p. p. 631—779.

[2]) On the Squirrels of the Neotropical Region. P. Z. S. L. 1878. p. p. 656—670. Plate XLI.

And this is a rule with only a few exceptions. Here more than ever the accurate knowledge of the specimens is the knowledge of the species. Therefore I abstain from diagnoses of the several species, which moreover sufficiently have been given by Allen and Alston, but on the other hand I will endeavor to describe in terms as short as possible every specimen, which shows an aberrant or remarkable variation in its mode of coloration or otherwise.

Grooved incisors, so characteristic in some African and Indian Squirrels, are not noticed in American species of this group. In two of our specimens of *Sciurus chrysuros* Pucheran, however the upper incisors show a grooving: as they are from Medellin and agree in all other respects entirely with the description of the type-specimen of Gray's *medellinensis*, I thought that this author had overlooked it, and wrote to Mr. Oldfield Thomas of the British Museum in order to examine the type: he kindly informed me however that the specimens of *medellinensis* Gray in that collection show no trace of a grooving. I thus incline to believe that in this case we must look upon it as an individual particularity.

Skeletons of American Squirrels seem to be very rare in Musea: we only possess a single of *Sciurus aestuans*: it presents 12 costales, 8 lumbares, 3 sacrales and about 27 caudales.

My warmest thanks to Prof. v. Siebold of the Munich Museum, who was kind enough to send over for my inspection the beautiful stuffed type-specimens of Wagner's *Sciurus albipes* (*varius*) and *socialis*. The nearer examination of these species beared for me a peculiar interest, as neither Allen nor Alston were in the opportunity of seeing them and therefore could not made out with accuracity to what species they belong or even if perhaps they might stand as true species.

Sciurus hudsonius.

1778. *Sciurus hudsonius* Pallas. Nov. spec. Glirium. p. 376.
1877. *Sciurus hudsonius* Allen. Mon. N. Am. Rodentia. p. 672.

The number of upper premolars seems to be very inconstant in this species, as I find some specimens with two and others with one: perhaps the first small one is often deciduous as Allen believes.

Hab. The greater part of the North-American continent, extending northward to the limit of forest vegetation and southward over the northern-two-thirds of the United States (Allen l. c. p. 684), perhaps to Honduras (see infra).

Mounted specimens in the Leyden Museum:

1. Adult male, Vancouver-Island, Forrer. — 2. Half grown individual, Labrador, Möschler, 1863. — 3. Female, North-America, Beske, 1824. — 4 and 5. Halfgrown specimens, North-America. — 6 and 7. Adult specimens, California, Dodds Valley, Gruber, 1866. — 8. Halfgrown, Mexico. — 9 and 10. Males, Honduras, Frank, 1873. — 11 and 12. Young specimens, locality unknown.

13. Skull of N°. 1. — 14. Skull of N°. 4. — 15. Skull of N°. 6. — 16. Skull of N°. 9, lower jaws wanting. — 17. Skull of N°. 10.

N°s. 1, 2, 3, 4, 5, 8 and 9 agree in color with typical *hudsonius*-specimens; 6 and 7 with *douglassi*-var.; 10, 11 and 12 with *richardsoni*-var.

Sciurus fossor.

1848. *Sciurus fossor* Peale. Mammals and Birds. U. S. Ex. Exp. p. 55.
1877. *Sciurus fossor* Allen. Mon. N.-Amer. Rodentia. p. 731.

This very easily recognizable species constantly shows two upper premolars, the first one being well-developed.

Hab. Oregon and California.

Mounted specimens in the Leyden Museum:

1 and 2. Adult males, California, Boucard, 1880. — 3. Adult, California, Dodds Valley, collected by Schulte, Frank, 1866. — 4. Male, California, Eldorado-county, Schlüter, 1878. Iris brown. — 5. Female, Eldorado-county, 13 January 1877. — 6. Adult specimen, California, Boucard, 1880. Lowerparts brownish-black, for the rest deep black throughout. — 7. Halfgrown, California, Boucard, 1880. Tail black with a brown shade, the rest deep black.

8.. Skull of N⁰ 1. — 9. Skull of N⁰. 6. — 10. Skull of N⁰. 7.

Sciurus niger.

1743. *Sciurus niger* Catesby. Carolina, II. p. 73. pl. LXXIII (Ex Allen's Mon. N.-Amer. Rodentia).
1877. *Sciurus niger* Allen. Mon. N.-Am. Rodentia. p. 717.

I have seen only the second edition of Catesby's splendid book. This edition bears 1754 as year and has been revised by Edwards. Plate 73 represents a specimen with a white band round the neck and plate 74 shows, under the name *Sciurus virginianus cinereus major*, a gray variety from Virginia and Carolina, where, says Catesby, they are injurious to the planters, by destroying their corn and pulse. One upper premolar.

Hab. From the Atlantic Coast Westward into Indiana and Southward into Texas, Mexico and perhaps as far south as Guatemala (Allen. l. c. p. 725).

Mounted specimens in the Leyden Museum:

1. Adult, Wisconsin, T. Kumlien, 30 March 1865. Colored like the typical *Sciurus ludovicianus.* — 2. Adult female, Wisconsin, Kumlien, 17 June 1865. — 3. Adult male, Wisconsin, Kumlien, 26 December 1865. — 4. Adult male, Missouri, Brandt, Hamburg, 1863. Received s. n. *Sciurus rufiventer.* — 5. Adult female, Tennessee, Nashville, Troost, 1830. — 6. Adult specimen, Louisiana, Schaufuss, 1868.

N°s. 2, 3, 4, 5 and 6 are colored like N°. 1. — 7. Adult, North-America. Entirely black colored, nose and ears white. Catesby's *niger* without white collar. — 8. Adult female, North-America, 1821. Represents the grey variation, called *virginianus* by Catesby. — 9. Adult male, North-America. Colored like the typical *cinereus* L. — 10. Adult specimen, North-America, Frank, 1880. Back and tail, sides of legs and feet blackish grey, lowerparts yellowish white, head and neck black, nose and ears white. — 11. Nearly fullgrown female, North-America, colored like the former, but less dark, feet white. — 12. Adult male, North-America, died in the Rotterdam Zoological garden, April 1867. The tips of all the hairs are pure white, giving thus the animal a beautiful white color.

13. Skull of N°. 1. — 14. Skull of N°. 7.

15. Adult specimen, Georgia. Colored like N°. 1. This individual has been described by Kuhl under the name *Sciurus anomalus* (vide infra p. 117).

Sciurus aberti.

1852. *Sciurus aberti* Woodhouse. Pr. Ac. Nat. Sc. Phil. VI. p. 220.
1877. *Sciurus aberti* Allen. Mon. N.-Am. Rodentia. p. 735.

The short black side-stripe seems to be constant in this species. As to the ear-tufts I call attention of naturalists; Allen remarks: »Of specimens obtained the same day at the »same locality, some have well-developed ear-tufts, while »others are wholly without them. The majority of the specimens taken in summer show no trace of ear-tufts."

The first upper premolar seems to be relatively larger in this species than in either *Sciurus fossor* or *Sciurus carolinensis* (Allen. l. c. p. 736).

Hab. From the Mountains of Central Colorado southward to the Apache Mountains of Arizona (Allen. l. c. p. 736).

In the Sierra madre this species is the only representant of the Genus (Alph. Forrer in litt.).

Mounted specimens in the Leyden Museum:

1 and 2. Adult males, Cindad Durango, Mexico, Forrer, 1883. No ear-tufts.

3 and 4. Skulls of N°s. 1 and 2.

Sciurus carolinensis.

1788. *Sciurus carolinensis* Gmelin. Systema naturae. p. 148.
1877. *Sciurus carolinensis* Allen. Mon. N.-Am. Rodentia. p. 700 (partim).
1878. *Sciurus carolinensis* Alston. P. Z. S. L. p. 658.

Our large series demonstrates that there is no reason to regard Allen's variety *yucatanensis* as a distinct and smaller species. Indeed we have specimens from Guatemala and Honduras which are as large as those from Tennessee and other Northern localities. So this species does not show a decrease in size southward. For the rest I only have to add to Allen's extensive description and Alston's observations that there are two upper premolars.

Hab. Southern Canada; East United States; Mexico; Yucatan; Guatemala; Honduras.

Mounted specimens in the Leyden Museum:

1. Adult female, Tennessee, Troost, 1830. Colored like the typical *carolinensis*-specimens. — 2. Young individual, Tennessee, Troost, 1830. — 3. Adult female, North-America, Becker, Hamburg. — 4 and 5. Adult and young, North-America. — 6. Adult male, North-America, Amsterdam-Zoological Garden, 5 December 1874. — 7. Adult, North-America, Beske, St. Petersburgh. Varietas alba. — 8 and 9. Young specimens, Yucatan, Boucard, 1880. N°s. 2, 3, 4, 5, 6, 8 and 9 colored like N°. 1. — 10, 11 and 12. Adult males, Yucatan, Boucard, 1880. — 13 and 14. Adult females, Yucatan, Boucard, 1880. — 15. Adult female, St. Thomas (perhaps introduced.) — 16. Adult male, Guatemala, Esciunti, Boucard, 1880. — 17 and 18. Adult male and

female, Guatemala. — 19. Adult male, Honduras. N°s. 10 till 19 are darker colored, the brownish-yellow lateral line is not developed and the fulvous suffusion beneath the surface of the pelage is more confused. No. 19 represents the darkest phase.

20. Skull of N°. 2. — 21. Skull of N°. 8. — 22. Skull of N°. 9. — 23. Skull of N°. 10. — 24. Skull of N°. 11. — 25. Skull of N°. 12. — 26. Skull of N°. 13. — 27. Skull of N°. 14. — 28. Skull of N°. 16. — 29. Skull of N°. 17.

30 and 31. Adult male and female, Mexico, Presidio, Forrer, 1883.

Sciurus variegatus.

1777. *Sciurus variegatus* Erxleben. Systema regni animalis. p. 421.
1837. *Sciurus socialis* Wagner. Abh. d. Math. phys. Klasse d. K. Bayer. Akad. d. Wissensch. II. p. 504. T. 5; *Sciurus albipes* Wagner. l. c. p. 501.
1843. *Sciurus varius* Wagner. Schreber's Säugethiere. Suppl. Bd. III. p. 168. T. CCXIII, D.
1867. *Sciurus arizonensis* Coues. Am. Nat. I. p. 357; *Sciurus griseoflavus* Gray. Ann. and Mag. Nat. Hist. p. 427.
1878. *Sciurus arizonensis* Alston. P. Z. S. L. p. 659; *Sciurus griseoflavus* Alston. l. c. p. 660; *Sciurus variegatus* Alston. l. c. p. 660; *Sciurus hypopyrrhus* Alston. l. c. p. 662.

A careful examination of our large series obliges me to bring together the two species distinguished by Alston, s. n. *Sciurus variegatus* and *hypopyrrhus*. I cannot find a single distinctif character. The type-specimens of Wagner's *Sciurus socialis* and *varius* of the Munich-Museum belong likewise to *variegatus; Sciurus varius* Wagner is an adult specimen of the *aureogaster*-variety; the sides of the red belly are whitish, the feet white, neck and base of tail as in *aureogaster*. *Sciurus socialis* Wagner, is a young specimen of the same variety; lowerparts light reddish white, feet white, neck and base of tail as in *aureogaster*. Both they are from Mexico, the locality where the *aureogaster*-variety seems to predominate.

It seems that the first upper premolar sometimes is deciduous, as I find in six skulls two premolars, and in two others a single one.

Hab. Arizona; California; Mexico; Guatemala; Honduras; Nicaragua; Costa-Rica; Panama; Ecuador (if the locality of our N⁰. 36 is correct).

Mounted specimens in the Leyden Museum:

1 and 2. Adult male and female, Mexico, Papantha, Deppe, December 1828. Colored like the *aureogaster*-variety, but neck and base of tail not rufous, fore legs red like lowerparts, hind-legs colored like upperparts; feet of N⁰. 1 black, of N⁰. 2 grizzled. — 3. Adult; Mexico; colored like N⁰. 2. — 4. Adult male. Head above between the ears and base of tail rufous, lowerparts red, legs like back but with a reddish tinge. — 5. Adult male, Mexico, presented by the Paris Museum; colored like N⁰. 4. — 6. Adult, Mexico, Frank, 1880. A link between the *aureogaster*- and the black-variety; head, fore legs and feet are black, upperparts dark grey, lowerparts with a rufous shade, tail like back. — 7 and 8. Adult specimens, Mexico, Sallé, 1860. Entirely black colored. — 9. Adult, Yucatan, Boucard, 1880. Glistening black colored. — 10. Male, Guatemala, Verreaux, 1865. Labeled *Sciurus douglasii* Bachm. Upperparts like N⁰. 1, head less dark, sides of the body, legs and feet red, lowerparts pure white, here and there with red patches. — 11. Adult, Honduras, Frank, 1873. Black with a slight fulvous tinge of the lowerparts. — 12. Adult female, Nicaragua, Verreaux, 1865. Received s. n. *Sciurus dorsalis* Gray. A broad dark band of a mahogany-color covers the back from about the middle of the ears. Head whitish. Sides, lowerparts, legs and feet white, all the hairs towards the base are colored like the back. — 13. Adult male, Nicaragua, Frank, 1880.

A broad black band covers the back. Head, sides of body, legs and feet reddish with small white spots. — 14 and 15, Adult specimens, Costa-Rica, Frank, 1880. Like N°. 1. but inside of fore legs pure white and rather large pure white spots to the belly and breast. Received s. n. *Macroxus nicoyana* Gray. — 16 and 17. Adult male and female, Panama, Boucard, 1880. Colored like Nos. 14 and 15, but the white spots are larger and the sides of the body show pure white tips of the hairs. — 18. Adult, Panama, Boucard, 1880. Like *aureogaster*. The neck and base of tail are of a fine mahogany-color, hairs of back with rather large white tips. Hind legs and feet colored like fore legs, whitish. Tail incomplete. — 19. Adult male, Panama, Boucard, 1880. Back deep black, head, sides of body, legs and feet pale yellowish brown. — 20, 21 and 22. Adult females, Panama, Boucard, 1880. Like N°. 19, but the back brownish black, for the rest more whitish. — 23. Young female, Panama, Boucard, 1880. Like N°. 19, but lowerparts redder. — 24. Adult male, Panama, Boucard, 1880. Colored like N°. 23. — 25, 26 and 27. Adult females and male, Panama, Boucard, 1880. Back like Nos. 20, 21 and 22, for the rest like N°. 19. — 28. Adult female, Panama, Boucard, 1880. Fore part of back black, hind part dark mahogany-color, like base of tail. Sides of body, lowerparts, legs and feet orange-colored. — 29 and 30. Adult females, Panama, Boucard, 1880. Back of a beautiful light brown color, other parts white with a slight reddish tinge. — 31 and 32. Adult females, Panama, Boucard, 1880. Like Nos. 29 and 30, but back with black patches. Hairs of tail annulated with reddish brown instead of black, as is the case in all the foregoing specimens. — 33 and 34. Adult females, Panama, Boucard, 1880. Back pale yellowish brown, with irregular brownish black spots. Tail like Nos. 31 and 32. — 35. Adult male, Panama, Boucard, 1880. Back with a feeble brownish shade. Hairs of tail broadly annulated with pale reddish brown. For the rest white with a slight reddish shade. — 36. Adult male, Ecuador, Quito, Frank, 1863. Exactly colored like N°. 4. — 37. Female, America, Frank, 1876. Agrees in coloration with N°. 16, but belly without white spots.

38. Skull of N°. 1. — 39. Skull of N°. 6. — 40. Skull of N°. 9. — 41. Skull of N°. 11. — 42. Skull of N°. 15. — 43. Skull of N°. 18. — 44. Skull of N°. 22. — 45. Skull of N°. 26. — 46. Adult specimen, Marañon, Rio Yavari. All the hairs are glossy black with a dark brownish shade: the hindmost part of the back is of a deep brown color. If the given locality is correct, this specimen should be the most southern representant of the species. — 47. Adult, Brazil, Hamburgh Museum. Upperparts grizzled, brownish black, hairs of tail black with light brown tips, lowerparts reddish brown; head, sides of body, legs and feet colored like back; a light brown spot behind the ears. It is not without hesitation that I bring this specimen under the head *variegatus*; but I do so because it is the only form known to me with which it agrees in some degree.

48. Skull of N°. 46. Two upper premolars. — 49. Skull of N°. 47. Two upper premolars.

Sciurus stramineus.

1841. *Sciurus stramineus* Eydoux et Souleyet. Voyage de la Bonite. Zool. I. p. 37. Atlas, pl. IX.
1877. *Sciurus tephrogaster* Allen. Mon. N.-Am. Rodentia. p. 763 (partim); *Sciurus variabilis* Allen. l. c. p. 768 (partim).
1878. *Sciurus stramineus* Alston. P. Z. S. L. p.p. 441 and 664.

I add to Alston's description that this Squirrel presents one upper premolar.

Hab. Ecuador; Peru.

Mounted specimens in the Leyden Museum:
1. Adult female, Ecuador, Quito, Frank, 1860. —

2. Adult specimen, habitat unknown, presented by the Paris Museum, 1843. Expédition de la Danaïde.

3. Skull of N°. 1. — 4. Skull of N°. 2.

Sciurus variabilis.

1832. *Sciurus variabilis* Is. Geoffroy. Etudes Zoologiques. Fasc. I. pl. IV; Mag. de Zool. pl. IV.
1878. *Sciurus variabilis* Alston. P. Z. S. L. p. 665.

I confirm Alston's statement (l. c. p. 668) that this species has only *one* upper premolar. Allen (Monogr. of N. A. Rodentia. 1877. p. 672) states in his synopsis that the species in question has *two* upper premolars. The latter author, l. c. p.p. 771 and 772, however had a single specimen at his disposition, agreeing in coloration with Wagner's *Sc. pyrrhonotus*, but it being a mounted example, perhaps its skull had been lost, and was a false one, or Allen has been mislead by an incorrect citation. Our seven skulls present *one* upper premolar.

Habitat. Costa-Rica; Panama; New-Granada; Ecuador; Peru; Chili; Bolivia; W. Brazil; Venezuela.

Mounted specimens in the Leyden Museum:

1. Young male, Costa-Rica, Frank, 1880. Upperparts olive, lowerparts pale red, hairs of tail tipped with red. — 2. Young female, Central America, Mad. Verdey, 1873. Colored like N°. 1. — 3. Female, Panama, Boucard, 1880. Upperparts dark olive, lowerparts red, hairs of tail with rather long red tips, end of tail black. — 4 and 5. Panama, Boucard, 1880. Colored like N°. 3, tails in a bad state. — 6. Young individual, Venezuela, Caracas, v. Lansberge. Colored like N°s. 1 and 2. — 7. Young male, Venezuela, Schaufuss, 1868. Colored like N°. 3, received s. n. *Sc. gilvicularis* Wgl. — 8. Half grown, St^{a}. Fé de Bogotà, New Granada, Ziffier. Colored like N°. 3. — 9. Female, New Granada. Upperparts

reddish black, sides bright red, lowerparts pure white, hairs of tail broadly tipped with bright red, tip of tail black. — 10. Rather young individual, St^{a}. Fé de Bogotà, v. Lansberge. Colored like N°. 9. — 11. Adult male, Ecuador, Frank, 1879. Upper- and lowerparts colored like N°. 3, tail very bushy, hairs with long red tips. — 12. Adult female, Ecuador, Frank, 1879. Colored like N°. 11. — 13. Young male, Ecuador, Quito, Frank, 1863. Colored like N°. 1. — 14. Halfgrown individual, Brazil, Verreaux, 1862. Colored like N°. 9. — 15. Adult male, Peruvian Amazons, Hualaga, Chamicuros, E. Bartlett, 27 May 1865. Colored like N°. 11, but lowerparts tawny. Received s n. *Sc. tricolor.* — 16 and 17. Adult females, Peruvian Amazons, Chamicuros and Hualaga (Santa-Cruz), E. Bartlett. Received s. n. *Sc. tricolor?* Upperparts bright black, lowerparts strawcolor, tails bushy, hairs of tail broadly red tipped. — 18. Adult male, Peruvian Amazons. Upperparts red, lowerparts pure white, tail very bushy, hairs with long red tips. — 19. Young, Peruvian Amazons. Upperparts and tail bright red, lowerparts pure white. — 20. Adult female, Peru, Frank, 1879. Colored like N°s. 16 and 17, lowerparts red. — 21. Halfgrown female, Chili, d'Orbigny. Upperparts brownish red grizzled, hind legs red, lowerparts dirty white, tail bushy with brownish red hairs.

22. Skull of N°. 2. — 23. Skull of N°. 3. — 24. Skull of N°. 6. — 25. Skull of N°. 11. — 26. Skull of N°. 13. — 27. Skull of N°. 18. — 28. Skull of N°. 20.

Sciurus chrysuros.

1845. *Sciurus rufoniger* Pucheran. Revue Zoologique. p. 336; *Sciurus chrysuros* Pucheran. l. c. p. 337.
1877. *Sciurus tephrogaster* Allen. Mon. N.-Am. Rodentia. p. 763 (partim); *Sciurus aestuans*, var. *rufoniger* Allen. l. c. p. 757 (partim).
1878. *Sciurus deppei* Alston. P. Z. S. L. p. 668; *Sciurus rufo-niger* Alston. l. c. p. 669.

In our specimens the upper incisors are slightly grooved and there are not *two* but *a single* upper premolar. Allen states that it has two upper premolars, the first quite large for a *Sciurus* and Alston ascribes to *Sciurus rufoniger* also two upper premolars. As I have personally extracted the skulls out of the skins there can be no error whatever in the above given results of my examination of the skulls. In my opinion the differences between *Sciurus rufoniger* Pucheran, *Sciurus chrysuros* Pucheran (*chrysosurus* Alston) and *Sciurus deppei* Peters, are not important enough to justify Alston's division into two species; I feel sure that larger series will confirm that they belong to the same species.

The specific title *rufoniger* has been applied by Gray in 1843 to an Indian Squirrel (List of the specimens of Mammalia, etc., p. 142).

Hab. Mexico; Guatemala; Honduras; Panama; New Granada and Columbia.

Mounted specimens in the Leyden Museum:

1. Adult male, Mexico, Vera-Cruz. — 2. Young specimen, Mexico, from the Paris Museum. — 3. Young specimen, New Granada, Medellin, Frank, 1872. — 4. Very young individual, Medellin, 1872. In N°s. 3 and 4 the black dorsal band is very good developed.

5. Skull of N°. 1. — 6. Skull of N°. 3. — 7. Skull of N°. 4.

Sciurus aestuans.

1766. *Sciurus aestuans* Linnaeus. Systema naturae. T. I. p. 88. N°. 9.
1877. *Sciurus aestuans*, var. *aestuans* Allen. Mon. N.-Am. Rodentia. p. 756; *Sciurus aestuans*, var. *rufoniger* Allen. l. c. p. 757 (partim).
1878. *Sciurus griseogenys* Alston. P. Z. S. L. p. 667;

Sciurus aestuans Alston. l. c. p. 668; *Sciurus pusillus* Alston. l. c. p. 670. Plate XLI.
1880. *Sciurus aestuans* Thomas. P. Z. S. L. p. 400.

According to Oldfield Thomas there are now in the British Museum, specimens brought from Ecuador by Buckley, which form links between *Sciurus aestuans* L. and *Sciurus griseogena* Gray. So I do not hesitate to bring them under a single head.

Alston believes *Sciurus aestuans* and *Sciurus pusillus* to be quite distinct species, meanwhile Allen regarded them as being the latter only the young state of the former. After a careful examination of our series and considering Alston's arguments, I feel sure that Allen is in the right. Moreover Alston gives an argument in favour to our opinion as he says (l. c. p. 670): »the British Museum specimens (of *Sciurus pusillus*) agree in size with Buffon's and Desmarest's descriptions and are *not yet quite adult*, as shown by their skulls and teeth."

According to Alston, *Sciurus pusillus* has two upper premolars as he observed in two skulls, but this number seems not to be constant, for, of three skulls of the supposed *Sc. pusillus* in our collection, two have one and the third has two upper premolars. And although two specimens show not the slightest difference either in size nor in coloration, the one has two and the other has one upper premolar (vide infra, Nos. 7 and 11). We possess also specimens from the same locality only differing in size and nearly always the small form clearly shows its youth by the undeveloped dentition.

Hab. Nicaragua; Costa-Rica; Panama; New Granada; Venezuela; Guiana; W. Brazil; Ecuador; Peru and Bolivia.

Mounted specimens in the Leyden Museum:

1. Adult female, Brazil, 1822. — 2, 3, 4 and 5. Adult female and adult males, Brazil. — 6. Adult female, Peruvian Amazons, Chyavetas, Bartlett, 3 August 1866. — 7,

8 and 9. Young male and young females, Peruvian Amazons, Hualaga, collected by Bartlett in 1867 and 1868. N°. 8 received s. n. *Sciurus irroratus*, young. — 10. Young male, Peruvian Amazons, Bartlett. — 11. Young individual, Peruvian Amazons, Frank, 1880. — 12 and 13. Young individuals, New Granada, Sta. Fé de Bogotà, Frank, 1842. — 14, 15 and 16. Young males, Surinam, Frank, 1871; N°. 14. Bartlett, 27 March 1866.

17. Skeleton, Brazil.

18. Skull of N°. 2. — 19. Skull of N°. 7. — 20. Skull of N°. 11. — 21. Skull of N°. 12. — 22. Skull of N°. 13. — 23. Skull without lower jaws, Brazil.

EUROPEAN AND ASIATIC SQUIRRELS.

Anderson [1]) is the first author, who endeavored to work out monographically the Asiatic Squirrels. His investigations bear a peculiar interest, as they are based upon an examination of nearly all the typical specimens preserved in the large Musea, by which he was enabled to break up a large series of nominal species. In the main points I accept his views, there are however some particularities in which I differ, as hereafter will appear. Especially I cannot accept his opinion that »the dentition and the form »of the skull throughout the group (viz. the genus *Sciurus*) »rather present a remarkable uniformity". If we compare for instance the skulls of *Sciurus davidianus*, *Sciurus lokriah* and *Sciurus zeylanicus* with the same parts of their nearest allies, it is obvious that the differences are very important. The same is the case with the dentition: so *Sciurus zeylanicus* has two upper premolars, meanwhile all the other large Squirrels have a single one, so *Sciurus syriacus* differs from all the other small-sized Squirrels from the continent by having a single upper premolar. Generally in species with two upper premolars there are very striking differences in the size of the foremost one.

---

[1]) Anatomical and Zoological Researches and Zoological results of the Yunnan Expedition. 1878.

The number of species of Asiatic Squirrels largely surpass the number of those inhabiting Europa, America and Africa taken together; for meanwhile Europa possess only a single species, America ten and Africa sixteen true Squirrels, there are in Asia more than thirty well defined species. The number of species increases from North to South; the largest number is to be found in the islands Sumatra and Borneo; here also are represented the largest and on the other hand the smallest species of the genus. Eastwards from Celebes and Java no Squirrel lives. Squirrels with stripes on back or sides are not to be found in Europa and America [1]), Africa has four striped Squirrels, Asia however nourishes a much larger series.

The description given by Sonnerat of his *Ecureuil de Gingi* (*Sciurus dschinschicus* Linn.Gm., *Sciurus deschinschicus* Anderson) is to short and at the same time appliable to more than one species, so that nobody can make out what species Sonnerat had before him. I thus pass over it in silence. I am convinced that the study of larger series will bring to light that there are several nominal species among the species from the Indian continent summed up in the following list.

SCIURUS.

A. Back and sides of body without longitudinal stripes.

I. Squirrels two times larger or more than our Common Squirrel. Tail much longer than head and body.

Sciurus indicus.

1777. *Sciurus indicus* Erxleben. Systema Regni Animalis. p. 420.

1878. *Sciurus indicus* Anderson. Yunnan Expedition. p. 222; *Sciurus maximus* Anderson. l. c. p. 223.

---

1) Transitory in some American species. A short black side-stripe seems to be constant in *Sciurus aberti* Woodhouse.

Back, outside of upper half of fore legs, outside of hindlegs, tail, the large tufts of ears and a large rhomboidal spot between the eyes of a beautiful maroon-red to blackish purple. Sometimes, as our N⁰ 3 shows, the tail, the upperparts of legs and a line on the back are entirely deep-black colored (*Sciurus maximus* (Gmelin) Anderson). Very characteristic to this species is the narrow maroon line from the anterior angle of the ear downwards to the side of the neck. The remaining parts yellowish white to yellowish orange. It is distinguished from the Ceylon-species by its purplish color, the long tufts of the ears, the uniformly colored hairs of the tail and the never black toes.

There is a single upper premolar, meanwhile the Ceylon-species has two.

The skeleton presents 13 costales, 6 lumbares, 3 sacrales and 32 caudales (Cuvier).

Hab. Western Ghats, easterly as far as Midnapur and Kuttack (Anderson, l. c. p. 223); Tarai-region of the Himalaya (Hodgson. P. Z. S. L. 1855. p. 126).

Mounted specimens in the Leyden Museum:

1. Adult female, Coast of Malabar, Mahrattas. Labeled *Sciurus elphinstonii* Sykes. Tail for its greatest part colored yellowish white, like the underparts of the body. — 2. Adult male, Coast of Malabar, Prévost. — 3. Adult female, Coast of Malabar, bought at London. — 4. Young specimen, India, Frank, 1880. Received s. n. *Sciurus purpureus*. This very young individual shows exactly the same distribution of colors as the adult ones. The incisors are pure white.

5. Skeleton of N⁰. 3.

6. Skull of N⁰. 1. — 7. Skull of N⁰. 2.

Sciurus giganteus.

1839. *Sciurus giganteus* McClelland. P. Z. S. L. p. 150.

1878. *Sciurus giganteus* Anderson. Yunnan Expedition. p. 220.

Ears tufted. Upperparts, eartufts, tail, hindlegs, upper half of fore legs and toes black or purplish brown. An elongated spot of the same color below the eye and two dark spots on the under surface of the chin. The underparts yellowish white to rich orange. The hairs of these parts are dark brown towards the base. No trace of white or yellowish on back or tail. There is one upper premolar.

Hab. North-Western Himalaya, Assam, Garo Hills, Sylhet, Cachar, from Northern Assam across to Yunnan, through Arracan and Burma to Tenasserim and the Malayan peninsula and Borneo (fide Anderson, l. c. p. 222).

Mounted specimens in the Leyden Museum:

1. Adult female, Himalaya, Hodgson. — 2. Adult female, Malacca, Diard. — 3. Adult male, Borneo, Pontianak, Diard.

4. Skull of N°. 1.

Sciurus bicolor.

1778. *Sciurus bicolor* Sparrmann. Gothenb. Vet. Handl. Vol. I. p. 70.

1878. *Sciurus bicolor* Anderson. Yunnan Expedition. p. 215 (partim).

Ears not tufted. Upperparts of head, back and tail vary from pale brown to brownish black, sometimes the dark hairs have white tips. Hind legs, upperhalf and posterior portion of lowerhalf of fore legs black, sometimes the black hairs are white tipped. Toes black. Cheeks pure white; there are two dark spots on the under surface of the chin. Underparts of body, inside of legs and the anterior part of the lower half of fore legs yellowish to orange. The hairs of the belly and inside of hind legs dark brown toward the base. Tail brown to black, the hairs however always are yellowish white to orange tipped for a smaller or larger extension. Tip of tail unicolor.

The skeleton presents 13 costales, 6 lumbares, 3 sacrales and about 30 caudales.

There is a single upper premolar.

Hab. Sumatra and Java.

Mounted specimens in the Leyden Museum.

1 and 2. Adult males, Sumatra, Padang, S. Müller, 1836. — 3. Adult female, Sumatra, Padang, J. F. Snelleman, 1878. Nos. 1—3 present back and tail pale brown. — 4. Adult specimen, Sumatra, Benkoelen, Wienecke, 1865. Upperparts and tail blackish brown. — 5. Adult female, West-Java, Diard, 1864. All the hairs have yellowish tips, those of the hairs of the tail especially are largely yellowish tipped. — 6. Adult male, Java, Kuhl and v. Hasselt. — 7. Female, Java. Nos. 6 and 7 have brown upperparts. — 8. Adult female, Java, Reinwardt. Upperparts maroon brown, hairs of tail broadly tipped with yellowish orange. — 9. Adult male, West-Java, Diard, 1864. — 10. Adult female, Java, Tjikao, Boié and Macklot. Nos. 9 and 10 have the back blackish brown, the tail like No. 8. — 11. Young individual, Java, Kuhl and v. Hasselt. Upperparts brown, tail broadly orange tipped. — 12. Young specimen, Java. Back black, hairs of tail broadly orange tipped. — 13. Very young female, Java, 1840. Upperparts and very short-hairy tail of an uniform brown color. — 14 and 15. Adult males, died in the zoological garden at Rotterdam and Amsterdam. Upperparts of a beautiful brownish black. Hairs of tail broadly orange tipped. — 16. Adult male, died in the zoological garden at Rotterdam. Upperparts of a rich glistering dark brownish black color. Hairs of tail broadly orange tipped. 17. Skeleton of an adult specimen, Java, Kuhl and v. Hasselt. — 18. Skeleton of a not full-grown specimen, Java, Kuhl and v. Hasselt.

19. Skull of No. 3. — 20. Skull of an adult specimen, Java. — 21. Skull of an adult specimen, North-East-Su-

matra, Deli, Tandjong-Morawa, B. Hagen, 1882. — 22. Skull of an adult specimen, Sumatra, J. F. Snelleman, 1878.

Sciurus albiceps.

1817. *Sciurus albiceps* Desmarest. Nouv. Dict. d'Hist. Nat. X. p. 105.
1820. *Sciurus leschenaultii* Desmarest. Mammalogie. p. 335.
1822. *Sciurus affinis* Raffles. Transac. Linn. Soc. London. XIII. p. 259.
1824. *Sciurus hypoleucos* Horsfield. Zoological Researches in Java. p.
1832. *Sciurus auriventer* Is. G. St. Hilaire. Magasin de Zoologie. pl. V.
1835. *Sciurus humeralis* Coulon. Mém. de la Société des Sc. Nat. de Neufchat. Vol. I. p. 122. pl. VIII.
1838. *Sciurus ephippium* S. Müller. Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. p. 147.
1878. *Sciurus bicolor* Anderson. Yunnan Expedition, p. 215 (partim).

This species is characterized by having untufted ears, by its yellowish brown to black brown back and tail, by its white to orange or golden colored belly and by its toes which are white to golden. It is distinguished from the other large-sized Indian Squirrels by its hairs of the belly being unicolor and not darker towards the base of the hairs and by its never black toes. It often has been confounded with *bicolor*, which however has the hairs of the belly bicolored, those of the tail always ending in white to orange tips and the toes black. Although the specimens of a given locality, Malayan peninsula, Sumatra, Java or Borneo, present some peculiarities, which has given rise to describe such, local-varieties as distinct species, there are among our large series of specimens from each of the named localities always some ones which deviate in color from the typical local race and which form so to say links between this and an other local variety, so that it is an impossibility to give a definite description of each. Therefore I bring them under a single head and looke upon them as forming a single species with more or less exactly circumscribed local-varieties.

The specific title *albiceps* is a very bad one as it only is applicable to specimens from Sumatra and to a few ones from Malacca, but *hypoleucos* is a bad one also, being only applicable to Sumatra- and some Borneo-specimens, meanwhile the name *auriventer* is more exact for those of the Malayan peninsula and Java. As there are in the nomenclature of systematic zoology yet a large number of bad and insignificant specific titles and as the name *albiceps* is not better or worse than other ones, I feel not obliged to change it, having it moreover the priority of date and this always ought to be respected.

Sciurus finlaysonii Horsfield seems to be a young individual of this species. The skull presents no very striking differences if compared with that of *Sciurus bicolor*. There is a single upper premolar.

Hab. Siam, the Malayan peninsula, Sumatra, Borneo and Java.

Mounted specimens in the Leyden Museum:

1 and 2. Adult males, Malacca, Diard, 1828. — 3 and 4. Adult male and female, Malacca, Landauer, 1864. — 5. Adult male, without locality. — 6. Adult specimen, Reinwardt. N°s 1—6 are representatives of the *auriventer*-variety; N° 3 however has the underparts more yellow, the upperparts yellowish white. — 7. Adult male, Singapore, Diard, 1858. Lowerparts pure white, upperparts and tail brown, head of a darker tint. It represents the *affinis*-variety. — 8, 9 and 10. Adult male and females, Sumatra, Padang, S. Müller, 1833. — 11. Adult female, Padang, Reinwardt. — 12. Adult male, Padang, Henrici. N°s. 8—12 are the specimens called *hypoleucos*

by Müller and Schlegel; they have the head white and represent the *albiceps*- or *hypoleucos*-variety. — 13. Young specimen, Sumatra, Palembang, Teysmann, 1878. Upperparts of a beautiful maroon, head darker, grizzled, lowerparts pure white. — 14. Adult male, Borneo, S. Müller, 1836. — 15 and 16. Adult males, Borneo, Banjermassing, Schwaner. — 17 and 18. Adult males, South-Borneo, Croockewit. — 19. Adult male, South-East-Borneo, Carl Bock, 1880. N°s. 14—19 represent the *ephippium*-variety; N°. 14 is the type of *ephippium* Müller. — 20. Adult female, Borneo, Müller, 1836. — 21. Young male, Borneo, Kapoeas, Schwaner. — 22 and 23. Adult males, Borneo, Diard, 1829. — 24. Adult male, Borneo, Sarawak, Frank, 1880. The broad black band along the spine, so characteristic to the *ephippium*-variety is present in N°s. 20—24, but confounds with the darker colored sides of the body, especially on the hind part of the back. — 25 and 26. Adult males, Borneo, mainland opposide Labuan, Frank, 1880. These specimens differ in some respects as they have small white points to the hairs of the tail and also to those of the sides of the body and outside of legs. It is a very curious mode of coloration, but I believe it to be an example of individual modification. — 27. Adult male, Borneo, S. Müller. — 28. Adult female, Borneo, Croockewit. N°s. 27 and 28 have no trace of black stripe on the back; N°. 27 has the upperparts brown, head pale brown; N°. 28 has back, tail and outside of legs maroon, the head yellowish, it is so to say a link between the *albiceps*- and the *hypoleucos*-variety. — 29. Adult male, Java, Teysmann, 1878. Upperparts and outside of legs brown to yellowish brown, tail straw-color, head above grizzled. Lowerparts and feet pure white.

30. Skull of N°. 3. — 31. Skull of N°. 4. — 32. Skull of N°. 7. — 33. Skull of N°. 8. — 34. Skull of N°. 10. — 35. Skull of N°. 22. — 36. Skull of an adult specimen, Borneo, Diard.

Sciurus zeylanicus.

1693. *Sciurus zeylanicus* Ray. Synopsis Quadrupedum. p. 265.
1878. *Sciurus macrourus* Anderson. Yunnan Expedit. p. 224.

Upperparts, base of tail, occiput, cheeks, eartufts, outside of upperhalf of legs, and toes blackish brown or black. All the other parts and a large spot between the ears yellowish white. All the hairs of the tail, excluding its base, have pure white tips. The above given distribution of colors is so constant and so peculiar to this species, that this alone suffices to characterize it. But the skull presents some very striking differences, which distinguish it from all the other large sized Asiatic Squirrels and which are hitherto unrecorded, as far as I know; I cite the following: the bony palate is ending posteriorly behind the molars and not before these organs, the skull is less broad and more elongate, the nasalia less curved, and finally there are two upper premolars of which the first is a very stout one, meanwhile all the other large-sized Squirrels possess only a single upper premolar. The shape of the molars also is quite different from that of the same parts in other Squirrels.

Hab. Ceylon.

Mounted specimens in the Leyden Museum:

1, 2, 3, 4, 5 and 6. Adult specimens, Ceylon, Colombo, Diard, 1859. — 7. Adult male, Ceylon, Frank, 1880.

8. Skull of N⁰ 1. — 9. Skull of N⁰ 2.

N⁰ 1—7 represent phases of the blackish brown form; N⁰ 7 is the black phase (*Sciurus tennantii* Layard).

II. Squirrels a few larger, as large as or smaller than our common Squirrel. Tail as long as or shorter than head and body.

α. Ears tufted or not.

Sciurus vulgaris.

1776. *Sciurus vulgaris* Liñ. Systema Naturae. XII ed. p. 86.
1821. *Sciurus alpinus* Cuv. Mamm. lith. 22e livr. fig.
1843. *Sciurus europaeus* Gray. List of the spec. of Mam̃. in the coll. of the British Museum. p. 139.
1867. *Sciurus calotus* Gray. Ann. and Mag. of Nat. Hist. p. 272.

See also: *Sciurus italicus* Bonap. Fauna ital. fasc. 23.

Lowerparts always pure white. Hairs of tail always red or black tipped. Two upper premolars. Skeleton with 12 costales, 7 lumbares, 3 sacrales and 21 caudales (12, 7, 3, 25 apud Cuvier; 12, 7, 3, 24 apud Wagner).

Hab. Europa and Northern Asia. The most Southern limits in Asia seem to be Japan, Northern China and Tibet. Eichwald stated that it abounds in the Caucasus.

Mounted specimens in the Leyden Museum:

The red variety: 1. Adult male, the Netherlands, Warmond, 8 June 1854, A. A. v. Bemmelen. — 2. Adult male, Maarssen, 17 March 1861, A. A. v. Bemmelen. — 3. Adult male, Hilversum, 12 October 1860, A. A. van Bemmelen. — 4. Adult male, Guelders, 4 June 1862. — 5. Adult specimen, Zutphen, 5 October 1859, Temminck Jr. — 6. Very young male, Zeist, 4 July 1862. — 7, 8 and 9. Two adult males and one female, Hanover, Norden, August 1859, de Graaf. — 10. Adult specimen, North Europe. — 11 and 12. Adult and young, Temminck's collection. — 13. Adult, Europe. Upperparts uniformly light reddish brown colored.

The Siberian variety: 14. Adult, East Siberia, from the Petersburgh-Museum, 1869. — 15. Nearly fullgrown female, Sweden, Schonen, 1 May 1877, Schlüter, 1878. Tail and earpencils reddish-black, middle of back red. — 16. Adult, East Siberia, from the Petersburgh-Museum, 1869. Tail and earpencils reddish black, like hands and feet. —

17. Adult, Siberia. Tail, earpencils, hands and feet dark blackish brown. — 18. Nearly fullgrown female, Sweden, Schonen, 11 May 1877, Schlüter, 1878. Colored like N⁰ 17. — 19. Adult female, Sweden, Quickjock, 26 November 1876, Schlüter, 1878. Colored somewhat intermediate between the red- and the Siberian-variety.

The Alpine variety: 20. Adult male, Switserland, St. Gothard, Schlüter, 1878. — 21 and 22. Adult males, Silesia, Riesengeb., Januar 1859 and November 1860, O. Finsch. — 23. Young specimen, Greece, Parnass-Mounts, 20 July 1866, Schlüter, 1870. — 24. Young, Sub-alpine regions of Europe. 25. Adult male, Siberia, Verdey, 1873. — 26. Adult, North-Europe. Purplish black. — 27. Adult, Russia. Colored like N⁰ 26, the tail ornated with a pure white tip. — 28 and 29. Adult specimens, Japan, v. Siebold. Upperparts and sides colored somewhat between the Siberian- and the Alpine-variety. — 30. Adult male, Guelders, Lidth de Jeude, 1866. Varietas alba. — 31. Adult female, the Netherlands, Wildenborgh near Vorden, 24 February 1865, Brants. White colored like N⁰ 30.

32. Skeleton of an adult specimen, Europe, Temminck's collection.

33. Skull of an adult individual, Guelders, 11 July 1862, A. A. v. Bemmelen.

N⁰ 1, 6, 7, 8, 9, 24 and 25 have unpencilled ears.

34. Young male (in spirits), Brunswick, Blasius.

Sciurus lis.

1842. *Sciurus lis* Temminck. Fauna japonica. p. 45. Pl. XII, figs. 1—4.

This species has not been mentioned by Gray in his Synopsis of the year 1867 and Anderson says no word about it in his Yunnan Expedition. A. Milne Edwards calls it *Sciurus Lys* (Recherches, etc. 1868 à 1874. p. 308.)

and believes that it should be regarded as synonymous with *Sciurus vulgaris*.

Besides the several differences between *Sciurus vulgaris* and *Sciurus lis* summed up by Temminck, I add that meanwhile the hairs of the tail of *Sciurus vulgaris* always are tipped with red or black, the same parts of *Sciurus lis* constantly are tipped with whitish.

There are two upper premolars.

The indigenous name of this Squirrel is not *lis* as Temminck wrote, but *risu*.

Hab. Japan.

Mounted specimens in the Leyden Museum:

1. Adult male, Japan, Jeddo, v. Siebold. — 2. Adult female, Japan, Bürger. — 3. Adult specimen, Japan, Bürger.

4. Skull of N° 1. — 5. Skull of N° 2.

Nos 2 and 3 have unpencilled ears.

Sciurus syriacus.

1828. *Sciurus syriacus* Ehrenberg. Symbolae physicae. Dec. I. Tab. 8.

1831. *Sciurus caucasicus* Pallas. Zoographica Rosso-Asiatica. T. I. p. 186.

1843. *Sciurus russatus* Wagner. Schreber's Säugethiere. Supplem. Bd. III. p. 155.

1867. *Sciurus historicus* Gray. Ann. and Mag. Nat. Hist. p. 273.

1876. *Sciurus fulvus* Blanford. Eastern Persia. T. II. p. 49. Pl. IV. fig. 1.

See also: *Sciurus anomalus* Güldenstädt, *Sciurus persicus* Gmelin and perhaps *Sciurus leucocephalus* Gray.

Ears with short pencils. Lowerparts yellowish white to golden yellow. One upper premolar.

Hab. Southern Russia and Southern Siberia, the Caucasus and Georgia, Asia minor, Syria, Arabia and Persia.

Mounted specimens in the Leyden Museum:
1. Adult male, South-Russia. — 2 and 3. Adult specimens, the Caucasus, Brandt. — 4. Adult female, Siberia, March 1871, Verdey, 1873. — 5. Adult specimen, Syria, from the Paris-Museum, 1868. — 6 and 7. Adult male and young female, Asia minor, Aidin, November and June 1876, Schlüter, 1878. — 8 and 9. Adult male and young female, Smyrna, 15 January 1872 and 11 May 1871, Krüper. — 10. Young specimen, Smyrna, v. Heuglin. — 11. Adult individual, Arabia, from the Berlin-Museum. Received s. n. *Sciurus libicus.*

12. Skull of N° 2. — 13. Skull of N° 5. — 14. Skull of N° 8. — 15. Skull of N° 9.

16. Adult male, Asia minor, Schneider, 1878 (in spirits).

Among our specimens of this species I found the Squirrel described by Kuhl (Beiträge zur Zoologie, 1820. p. 68) under the name *Sciurus anomalus.* His description clearly shows that he had not a true *Sciurus syriacus* before him, for he described it as follows:" Latere inferiori, internis extremitatum partibus, antibrachii et tarsorum externis *auriculisque vulpinis;* latere superiori ex cinerascenti, nigro rufoque vario, pilisque basi cinereis, deinde flavo rufis, tum bruneo nigris, apice denique flavorufis, sed longioribus nigris. *Cauda maxime floccosa, infra pulchre rufa, supra dorsi colore.* Corpore 13, cauda 11 poll. circa longis." This description agrees entirely with the individual before me, and also agrees with the description *Sciurus niger*, var. *ludovicianus.* It is also not an Indian Squirrel as Kuhl thought, but an American which may stand in our catalogue under the named specific title (Vide supra p. 95). The locality is not Georgia in Asia as was written upon the label, but Georgia in North-America. *Sciurus syriacus* moreover is a small species, measuring: the body about 26 c. m. and the tail about 21

c. m., meanwhile *Sciurus anomalus* Kuhl measures: the body about 34 c. m. and the tail about 30 c. m.

Sciurus alstoni.

1878. *Sciurus alstoni* Anderson. Yunnan Expedition. p. 252. pl. XXI.

Characterized by the beautiful pure white tufting to the ears, which projects a considerable way backwards. Anderson does not mention not the number of upper premolars and where at present the type-specimen is preserved.

Hab. Unknown, probably Borneo (Anderson, l. c.).

No specimens in the Leyden Museum.

Sciurus hippurus.

1832. *Sciurus hippurus* Is. Geoffr. St. Hilaire. Etudes zoologiques. Pl. 6.
1878. *Sciurus hippurus* Anderson. Yunnan Expedition. p. 241.

There are two upper premolars. Between the eye-holes the skull shows a very characteristic depression.

Hab. Malayan Peninsula, Sumatra and Borneo.

Mounted specimens in the Leyden Museum:

1. Adult specimen, Singapore, Landauer, 1864. — 2 and 3. Adult males, Sumatra, S. Müller, 1835. — 4. Adult female, Borneo, Kapoeas-river, Schwaner. — 5. Adult male, Borneo, Banjermassing, Schwaner. — 6. Adult female, Borneo, Pontianak, Diard. — 7. Male, Borneo, Frank, 1880.

8. Skull of N⁰. 2.

Sciurus erythraeus.

1778. *Sciurus erythraeus* Pallas. Novae species quadrupedum. p. 377.
1878. *Sciurus erythraeus* Anderson. Yunnan Expedition. p. 236; *Sciurus ferrugineus* Anderson. l. c. p. 243.

There are two upper premolars of which the first is very strongly developed.

Hab. Bhutan, Burma, Arracan, Pegu, Rangoon, Siam and Cambodja.

Mounted specimens in the Leyden Museum:

1. Adult specimen, Arracan, Frank, 1865. — 2. Adult specimen, India, Frank, 1880. N°s 1 and 2 have the tip of the tail pure white (var. *keraudrenii*). — 3, 4 and 5. Adult specimens, Cambodja, Diard. Type-specimens of *Sciurus cinnamomeus* Temminck. — 6. Adult male, Cambodja, Frank. — 7. Adult female, locality unknown, Lidth de Jeude, 1866.

8. Skull of N°. 3. — 9. Skull of N°. 4.

Sciurus lokroides.

1836. *Sciurus lokroides* Hodgson. J. A. S. B. p. 232.
1878. *Sciurus lokroides* Anderson. Yunnan Expedition. p. 247; *Sciurus bimaculatus* Anderson. l. c. p. 235.

The chief difference between *Sciurus bimaculatus* und *Sciurus lokroides* is that the former has the extreme tip of the tail pure white, preceded by a broad black band. I regard this as an individual phenomenon; it moreover is a long known fact that the tail in different species of Squirrels sometimes is ornated with a white tip. For the rest there are no differences neither in skull nor in dentition. There are two upper premolars.

Hab. Nepal to Western Yunnan, Assam, Tippera, Dacca, Arracan, Malacca and the Island of Preparis (Anderson. l. c.).

Mounted specimens in the Leyden Museum:
1 and 2. Adult specimens, Nepal, Hodgson. — 3. Adult specimen, Tibet, Hodgson. — 4. Adult male, Malacca. Type of *Sciurus bimaculatus* Temminck.
5. Skull of N°. 1. — 6. Skull of N°. 2. — 7. Skull of N°. 4.

Sciurus lokriah.

1836. *Sciurus lokriah* Hodgson. J. A. S. B. p. 232.
1878. *Sciurus lokriah* Anderson. Yunnan Expedition. p. 250; *Sciurus rufigenis* Blanford. P. A. S. B. p. 93 and J A. S. B. p. 156. pls. VII and VIII.

There are two upper premolars. Nasalia much more elongated and more slender than in *Sciurus lokroides.* The underparts seem to vary from rich orange to pale yellow and bluish-grey, the white eartuft although very constant, sometimes is absent, and in the latter case this species externally closely approaches *Sciurus lokroides.*

Hab. Nepal, the Sikkim Himalaya and Assam, also Arracan and the Khasia hills (Anderson. l. c.).

Mounted specimens in the Leyden Museum:
1. Adult specimen, Tibet, Hodgson. — 2. Adult specimen, Nepal, Paris-Museum, 1868. Types of the species.
3. Skull of N°. 2.

Sciurus pernyi.

1867. *Sciurus pernyi* A. Milne Edwards. Revue et Mag. de Zoologie. p. 230. pl. XIX.
1878. *Sciurus pernyi* Anderson. Yunnan Expedition. p. 253.

The number of upper premolars is unknown.

Hab. Sé tchouan, China.
No specimens in the Leyden Museum.
This species perhaps is the same as the former.

Sciurus davidianus.

1867. *Sciurus davidianus* A. Milne Edwards. Revue et Mag. de Zoologie. p. 196.
1868—1874. *Sciurus* (*Tamias*) *davidianus* A. Milne Edwards. Recherches etc. p. 160. pls. 16 and 18, fig. 2.

Anderson seems to believe that this species belongs to the *Tamias*-group, for he does not mention it in his summing up of the Indian Squirrels. I regard its with Milne Edwards as a form between the true *Sciurus* and the true *Tamias*. It possess cheek-pouches, but they are very small compared with the same parts in *Tamias*-species, its skull, although more elongated than generally is to be found in *Sciurus*-species, differs in no other way from the latter and finally its body is not ornated with longitudinal bands or stripes as is always the case in *Tamias*-species.

There are two upper premolars, the first of them is a very large one.

In comparing Milne Edwards' figure of this species with his description, it appears that they do not correspond together: the fact is that the figure is to dark colored.

Hab. China, neighborhood of Pekin.

Mounted specimens in the Leyden Museum:
1. Adult specimen, China, neighborhood of Pekin, David, Paris-Museum, 1868. One of the types of the species.
2. Skull of N°. 1.

Sciurus caniceps.

1842. *Sciurus caniceps* Gray. Ann. and Mag. Nat. Hist. p. 263.
1878. *Sciurus caniceps* Anderson. Yunnan Expedition. p. 229; *Sciurus griseimanus* Anderson. l. c. p. 233.

There are two upper premolars.

Hab. Saigon, Cambodja, Siam, Tavoy, Tenasserim, Malacca and Salanga-island.

Mounted specimens in the Leyden Museum:
1 and 2. Adult specimens, Bhotan?, Frank, 1880. — 3. Young individual, Bankok, Paris-Museum, 1868. — 4. Adult male, Malacca, Frank, 1880. — 5. Adult specimen, Salanga-island, Francfurt, 1881.
6. Skull of N° 1. — 7. Skull of N° 2. — 8. Skull of N° 3. — 9. Skull of N° 5.

Sciurus atrodorsalis.

1842. *Sciurus atrodorsalis* Gray. Ann. and Mag. Nat. Hist. p. 263.
1878. *Sciurus atrodorsalis* Anderson. Yunnan expedition. p. 233; *Sciurus gordoni* Anderson. l. c. p. 240. pl. XIX; *Sciurus sladani* Anderson. l. c. p. 242. pl. XX.

The grizzled medial line of the belly is not constant, not even in individuals from the same locality: thus I find no reason to separate *Sciurus gordoni.* Our N° 2 is colored almost like *Sciurus sladani:* it evidently is a not fully dressed individual. There are two upper premolars. Skeleton with 12 or 13 costales, 7 or 6 lumbares and 24 to 28 caudales (Anderson. l. c. p. 235).

Hab. Nepal, Turkestan, China?, Formosa, Upper Burma, Assam, Martaban, Malacca, Cambodja?, and Cochin-China?

Mounted specimen in the Leyden Museum:

1. Adult male, Nepal, Frank, 1866. — 2. Adult specimen, Turkestan, Paris-Museum, 1868. — 3, 4 and 5. Adult males, China?, Frank, 1877. — 6. Adult specimen, N. W. Formosa, Swinhoe, 1863. Received s. n. *Sciurus erythraeus*.

7. Skull of N° 6.

Sciurus quinquestriatus.

1871. *Sciurus quinquestriatus* Anderson. P. Z. S. L. p. 142. pl. X.
1878. *Sciurus quinquestriatus* Anderson. Yunnan Expedition. p. 266.

The number of upper premolars has not been recorded by Anderson.

Hab. Kakhyen hills, within the Chinese frontier at an elevation of about 3000 feet (Anderson, l. c.).

No specimen in the Leyden Museum.

Further investigations must make out if the five ventral stripes are constant in all the specimens or accidentally as is the case with the other so-called belly-banded Squirrels. And if it turns out that my supposition is correct, than I feel sure that it will appear that this species is synonymous with *Sciurus atrodorsalis* or perhaps with *Sciurus lokroides*.

Sciurus castaneoventris.

1842. *Sciurus castaneoventris* Gray. Ann. and Mag. Nat. Hist. p. 263.

1878. *Sciurus castaneoventris* Anderson. Yunnan Expedition. p. 238.

Sometimes the belly shows a grizzled medial line. There are two upper premolars.

Hab. China (Western China according to Anderson), Formosa and Hainan.

Mounted specimens in the Leyden Museum:
1. Adult male, China, Ningpo, 15 January 1872, Frank, 1880. — 2. Male, China, Frank, 1876. — 3. Young individual, China.
4. Skull of N° 1.

Sciurus pygerythrus.

1832. *Sciurus pygerythrus* Is. Geoffroy St.-Hilaire. Mag. de Zoologie.
1878. *Sciurus pygerythrus* Anderson Yunnan Expedition. p. 227; *Sciurus phayrei* Anderson. l. c. p. 230; *Sciurus blanfordii* Anderson. l. c. p. 230.

The only striking difference between *Sciurus pygerythrus* and *Sciurus phayrei* consists in the dark side-bands of the latter species: this characteristic however is not constant and is sometimes absent in *phayrei*-specimens and sometimes occurs in *pygerythrus*- and in *blanfordii*-specimens. There are two upper premolars. Skeleton with 12 costales, 7 lumbares and 26 caudales (Anderson. l. c. p. 230).

Hab. Upper Burma, Pegu and Martaban.

Mounted specimens in the Leyden Museum:
1, 2, 3 and 4. Males and female, Burma, Toughu, Lord Walden, 1869.

5. Skull of N⁰ 1.

N⁰ 4 has a broad blackish-brown side-stripe.

Sciurus diardii.

1879. *Sciurus diardii* (Temminck in litt.) Jentink. Notes from the Leyden Museum. I. p. 39.

There are two upper premolars of which the first one also is very good developed.

Hab. Nusa-Kambangan, situated off Tjilatjap, close to the South coast of Java.

Mounted specimens in the Leyden Museum:

1. Adult female, Nusa-Kambangan, Diard. Type of the species.

2. Skull of N⁰ 1.

Sciurus tenuis.

1824. *Sciurus tenuis* Horsfield. Zoological Researches in Java.

1839–1844. *Sciurus modestus* Müller and Schlegel. Verhandelingen etc. p. 96. T. 14. figs. 1—3.

1878. *Sciurus tenuis* Anderson. Yunnan Expedition. p. 255.

There are two upper premolars.

It was not without long hesitation that Müller and Schlegel have given the specific title *modestus* to this species, as they were not sure if it was not the same species as Horsfield's *tenuis*. I agree with Blyth and Anderson in considering them identical.

Sciurus philippensis Waterhouse and *Macroxus chinensis* Gray are closely allied to *Sciurus tenuis* Horsfield (Anderson. l. c. p. 255).

Hab. The Malayan Peninsula, Sumatra, Borneo, Java (fide Anderson), the Philippines?, China, Canton (fide Müller and Schlegel).

Mounted specimens in the Leyden Museum:

1 and 2. Adult specimens, Malacca, Diard. — 3 and 4. Adult and young males, Sumatra, S. Müller, 1837. — 5. Adult male, Sumatra, Mount Singalang, S. Müller, July 1837. — 6. Adult female, Sumatra, Padang, Müller. — 7 and 8. Adult specimens, Sumatra, Müller. — 9 and 10. Adult individuals, Sumatra. — 11. Adult specimen, Borneo, S. Müller. — 12. Adult female, Borneo, Schwaner. — 13. Not fullgrown female, Borneo, Diard. Labeled *Sciurus minor* Diard. — 14. Adult male, Borneo, Croockewit. — 15. Young individual, Mainland opposite Labuan, North-Borneo, Frank, 1880.

16. Skull of N⁰ 5.

Nos 1—14 are the type-specimens of *Sciurus modestus* Müller and Schlegel.

Sciurus murinus.

1839—44. *Sciurus murinus* (Forsten) Müller and Schlegel. Verhandelingen over de Natuurlijke Geschiedenis etc. Zoologie. p. 87.

1878. *Sciurus murinus* Anderson. Yunnan Expedition. p. 256.

There are two upper premolars. Anderson has given in the »Yunnan Expedition" a very good description of this species.

Hab. Celebes.

Mounted specimens in the Leyden Museum:

1. Adult female, North-Celebes, Forsten. Labeled *Sciurus umbrinus* Tem. — 2. Adult specimen, North-Celebes,

Forsten. Labeled *Sciurus umbrinus* Tem. — 3. Adult female, Celebes, Gorontalo, v. Rosenberg, 5 May 1864. — 4. Adult, Celebes, Menado, v. Musschenbroek, 1875. — 5. Young individual, Celebes, Menado-Langowan, v. Musschenbroek, September 1875.

6. Skull of N⁰ 1, without lower jaws. — 7. Skull of N⁰ 3. — 8. Skull of an adult specimen, Celebes, Forsten.

N°s 1 and 2 are the types of the species.

Sciurus exilis.

1838. *Sciurus exilis* S. Müller. Tijdschrift voor Natuurlijke Geschiedenis en Physiologie. p. 148.
1839—1844. *Sciurus exilis* Müller and Schlegel. Verhandelingen etc. p. 97. T. 15, figs 4—6.
1878. *Sciurus exilis* Anderson. Yunnan Expedition. p. 257.

Upper incisors yellowish white, lower ones white, feeble. Two upper premolars. Skeleton with 12 costales, 7 lumbares, 2 sacrales and 13 caudales.

Hab. Malacca, Sumatra and Borneo.

Mounted specimens in the Leyden Museum:

1. Adult specimen, Malacca, Diard. Labeled *Sciurus exiguus*. — 2. Adult male, Sumatra, Mount Singalang, Müller. One of the types. — 3. Adult male, Borneo, Müller. One of the types. — 4. Adult male, Borneo, Schwaner. — 5. Adult female, Southern Borneo, Croockewit. — 6. Young specimen, Mainland opposite Labuan, North-Borneo, Frank, 1880.

7. Skull of N⁰ 2.

8. Adult male, South-Eastern Borneo, C. Bock, 1879 (in spirits).

9. Skeleton of an adult female, South-Eastern Borneo, C. Bock, 1879.

β. Ears very closely fringed.

Sciurus rubriventer.

1839—1844. *Sciurus rubriventer* (Forsten) Müller and Schlegel. Verhandelingen etc. p. 86.

1878. *Sciurus bicolor* Anderson. Yunnan Expedition. p. 215 (partim).

This species has nothing in common with *Sciurus bicolor* as Anderson seems to believe. It is one of the best definited species and it is very curious that Anderson has not recognized it as such. He has examined the types of *albiceps*, *leschenaultii*, *auriventer*, *hypoleucus*, *bicolor* var. *sondaica* and *ephippium* (l. c. p. 217) and although he has studied the Squirrels of our collection also, he must have overlooked our typical specimens of *rubriventer*. It is a Squirrel equal in size to *Sciurus hippurus* and thus much smaller than *Sciurus bicolor*; the large red ears are fringed with numerous jet-black hairs and not naked as in *hippurus* and *bicolor*. The belly of *rubriventer* always is red, what never is the case in *bicolor*. Hairs of tail black with broad red rings. The skull of *rubriventer* is narrower than that of *bicolor*, the nasalia being elongated and less broad, moreover *bicolor* has one upper premolar, meanwhile *rubriventer* has two upper premolars.

Hab. Celebes.

Mounted specimens in the Leyden Museum:

1. Adult male, Celebes, Forsten. Type of the species. — 2. Adult female, Celebes, Modelido, v. Rosenberg, May 1863. — 3. Adult female, Celebes, Toelabello, 27 April 1864, v. Rosenberg. — 4 and 5. Adult specimens, Celebes, Menado, v. Musschenbroek, 1877. — 6. Adult female, Menado, Teysmann, 1878.

7. Skull of N° 2.

Sciurus rosenbergii.

1879. *Sciurus rosenbergii* Jentink. Notes from the Leyden Museum. I. p. 37.

There are two upper premolars, the first one is very stout for a Squirrel of such a small size.

Hab. Sanghi-islands.

Mounted specimens in the Leyden Museum:

1. Adult male, Sanghi-islands, v. Rosenberg, 7 November 1864. — 2 and 3. Adult females, Sanghi-islands, v. Rosenberg, November 1864. — 4. Adult male, Sanghi-islands, 16 January 1866, Hoedt. — 5, 6, 7, 8 and 9. Adult males, Siao, Hoedt, October 1865. — 10. Adult male, Siao, November 1865. — 11 and 12. Adult females, Siao, Hoedt, October 1865. — N°s 1—13 are the typical specimens of the species. — 13 and 14. Adult specimens, Sanghi-islands, Frank, 1880.

15. Skull of N° 4. — 16. Skull of N° 6. — 17. Skull of N° 8. — 18. Skull of N° 10.—19. Skull of N° 11. — 20. Skull of N° 13.

Sciurus steerii.

1876. *Sciurus steerii* Günther. P. Z. S. L. p. 735. pl. LXIX.

The number of upper premolars is unknown.

Hab. Philippine islands, Balabac, Palawan.

No specimens in the Leyden Museum.

Sciurus leucomus.

1839—1844. *Sciurus leucomus* (Forsten) Müller and Schlegel. Verhandelingen etc. p. 87.

1878. *Sciurus leucomus* Anderson. Yunnan Expedition. p. 251.

There are two upper premolars, the first is very stoutly developed. The skeletons present 13 costales, 6 lumbares, 3 sacrales and about 25 caudales (the tails are incomplete).

Hab. Celebes.

Mounted specimens in the Leyden Museum:

1. Adult female, Celebes, Menado, Forsten. — 2. Adult male, Kema, Forsten. N°s 1 and 2 are the types of the species. — 3. Adult male, Menado, Teysmann, 1878. — 4. Fullgrown individual, Menado, v. Musschenbroek, 1877. — 5. Adult specimen, Celebes, v. Duyvenbode, 1866. — 6. Adult male, Celebes, Frank, 1876. — 7. Adult specimen, Celebes. — 8. Adult male, Celebes, v. Rosenberg, 1865. — 9 and 10. Adult male and female, Toelabello, 10 May 1864, v. Rosenberg. — 11. Adult male, Pagowat. — 12. Adult male, Panybie, v. Rosenberg, September 1863. — 13. Adult female, Modelido, May 1863, v. Rosenberg. — 14. Adult male, Celebes, v. Rosenberg, 1865. — 15. Adult female, Celebes, v. Rosenberg, 1865. — 16. Adult specimen, Limbotto, v. Musschenbroek, January 1876. — The pale spots on the sides of the neck are very good developed in N°s 1—12, almost invisible in N°s 12—15 and totally absent in N°s 15 and 16.

17. Skeleton of an adult specimen, Celebes, Forsten, 1841. — 18. Skeleton of a young individual, Celebes, Forsten, 1841.

19, 20, 21 and 22. Skulls of adult specimens, Celebes, Forsten, 1841. — 23. Skull of a nearly fullgrown specimen, Menado, v. Musschenbroek, 1876. — 24. Skull of N° 12. The lower jaws are wanting. — 25. Skull of N° 14.

Sciurus soricinus.

1838. *Sciurus soricinus* Waterhouse. Cat. Mamm. Zool. Soc. London. p. 46.

1839—1844. *Sciurus melanotis* S. Müller and Schlegel. Verhandelingen etc. p. 98. T. 14. figs 4 and 5.
1878. *Sciurus soricinus* Anderson. Yunnan Expedition. p. 265.

There are two upper premolars. Skeleton with 13 costales, 6 lumbares, 2 sacrales and 22 caudales.

Hab. Sumatra, Banka, Borneo and Java.

Mounted specimens in the Leyden Museum:
1. Adult female, Sumatra, Padang, 1837, S. Müller. — 2. Adult male, Sumatra. — 3. Male, Borneo, Müller. — 4 Male, Borneo, Pontianak, Diard. — 5. Male, Borneo, Banjermassing, Schwaner. — 6. Female, Borneo, Karau-river, Schwaner. — 7. Adult specimen, Java, Müller. — 8. Female, Java, Müller. — 9 and 10. Adult specimens, Java. The for this species so characteristic pale neck-spot is absent or hardly visible in the Javan-specimens.
11. Skull of No 8. — 12. Skull of an adult female, Borneo, Diard. — 13 and 14. Adult skulls, Java, Boie and Macklot. — The lower jaws of Nos 12 and 13 are wanting.
15 and 16. Adult specimens, Banka, Teysmann, 1878.
17. Skeleton of an adult male, South-Eastern Borneo, C. Bock, 1879.
18. Skull of N⁰ 15.

B. Sides of the body with longitudinal stripes.

Sciurus prevostii.

1820. *Sciurus prevostii* Desmarest. Mammalogie. p. 335.
1878. *Sciurus prevostii* Anderson. Yunnan Expedition. p. 269.

The different phases of this species have been exposed and described by Schlegel and Anderson very clearly and exact; I only have to add a conspecies from Biliton which differs from the Banka-form by its redder shoulders; in this characteristic it agrees with the Sumatran-conspecies.

There are two upper premolars, the first one is very developed.

Hab. China (Gray), the Malayan Peninsula, Sumatra, Banka, Biliton, Borneo and Celebes.

Mounted specimens in the Leyden Museum:

1, 2 and 3. Adult males and female, Malacca, Diard. — 4, 5 and 6. Adult specimens, Malacca, Landauer, 1864. — 7, 8 and 9. Adult specimens, Sumatra, Teysmann, 1865. — 10 and 11. Adult specimens, Sumatra, Lidth de Jeude, 1866. — 12. Adult specimen, Banka, v. d. Bossche, 1861. — 13 and 14. Adult male and female, Biliton, Teysmann, 1877. — 15, 16 and 17. Adult male and females, Borneo, Pontianak, Diard. — 18, 19, 20, 21. Males and females, Borneo, Kapoeas-river, Schwaner. — 22. Male, Borneo, Doeson-river, Schwaner. — 23. Adult male, Borneo, Lidth de Jeude, 1866. — 24. Adult specimen, South-Eastern Borneo, C. Bock, 1879. — 25 Adult male, Borneo, Frank, 1880. — 26 and 27. Adult specimens, mainland opposite Labuan, North-Borneo, Frank, 1880. — 28. Adult male, Celebes, Kema, Forsten. — 29. Adult male, Celebes, Menado, Forsten. — N^0 12 is the type of *Sciurus prevostii bangkanus* Schlegel; N°s 15, 16 and 17 are the type-specimens of *Sciurus rafflesii*, var. *borneoensis* Müller and Schlegel; N°s 18—22 are the type-specimens of *Sciurus atricapillus* Schlegel; N^0 28 is the type of *Sciurus erythrogenys* Schlegel (*Schlegelii* Gray); N° 29 is the type of *Sciurus erythromelas* Temminck.

30. Skull of an adult specimen, Sumatra. — 31. Skull of N^0 15. — 32. Skull of N^0 16. — 33. Skull of N^0 17. — 34. Skull of N^0 24. — 35, 36, 37 and 38. Skulls of adult specimens, Borneo.

Sciurus plantani.

1801. *Sciurus plantani* Ljung. Kon. Vetensk. Ac. N. Handl. p. 99. pl. 1.

1878. *Sciurus vittatus* Anderson. Yunnan Expedition. p. 266; *Sciurus plantani* Anderson. l. c. p. 267.

Although it seems that specimens described as *Sciurus vittatus* prevail on the Indian Continent, in Sumatra, Banka and Borneo, meanwhile the *Sciurus plantani* or *nigro-vittatus* is more frequent in Java, they must be regarded as mere varieties of the same species. In the first place I observe that among the Javan-specimens there are two principal modifications of color, viz: specimens with reddish underparts and a ditto circle round the eyes and others where the named parts are slaty black or grey colored; that others from the same locality are equally referable to both and that the same phenomenon is observed among the specimens from Sumatra, Borneo and the Indian Continent. So we possess two specimens from Canton, China, one of which has the underparts of a beautiful red, meanwhile the other has the same parts slaty black; moreorer we have a specimen from Nepal with a slaty colored belly which cannot be distinguished from the Javan-specimens which are colored on the same manner. The pale and black side-bands also present many phases of intensity.

Skeleton with 12 costales, 7 lumbares, 3 sacrales and 24 caudales.

There are two upper premolars, the first of which is well-developed.

Hab. China; Nepal and perhaps the whole Indian Continent eastward Nepal; the Malayan Peninsula, Sumatra, Banka, Borneo and Java. Two of our specimens have been collected in Celebes, according to the late Teysmann's labels.

Mounted specimens in the Leyden Museum:

1. Adult female, China, Canton. Lowerparts red, black side-stripe very small. — 2. Adult male, China, Canton, Witt. Lowerparts slaty black, black side-stripe very broad. — 3. Adult male, Nepal, Hodgson. Lowerparts slaty black, side-stripe colored like back. — 4 and 5. Adult males, Malacca, Diard, 1858. Lowerparts red, black side-stripe very developed. — 6, 7, 8, 9, 10, 11, 12 and 13. Males and females, Sumatra. Lowerparts from brilliant red to pale red. — 14, 15 and 16. Adult specimens, Sumatra, Padang, Snelleman, 1878. Lowerparts pale red. — 17, 18 and 19. Adult male and females, Sumatra. Lowerparts slaty black, black side-stripe small. — 20, 21, 22 and 23. Adult specimens, Banka, v. d. Bossche, 1861. Lowerparts varying from red to pale red. — 24 and 25. Adult female and male, Borneo, S. Müller. — 26, 27 and 28. Adult males and female, Borneo, Banjermassing, Schwaner. N°s 24—28 with the underparts red, black side-stripe well developed. — 29 and 30. Adult male and female, Banjermassing, Schwaner. Lowerparts pale reddish brown. Black side-stripe small, diminishing. — 31 and 32. Adult male and female, Southern Borneo, Croockewit. — 33 and 34. Adult male and female, Borneo, Pleyharie, Semmelink, 1866. — 35 till 45. Males and females, South-Eastern Borneo, C. Bock, 1879. Nos 31—45 have the lowerparts red to greyish red tinged. — 45 and 46. Adult males, Celebes, Teysmann, 1878. Underparts red. — 47 till 59. Males and females, West-Java, Diard, 1862. Underparts pale red, dark side-stripe more or less intense, its color varies from black to brownish or colored like the back. — 59. Adult, Java, S. Müller, 1837. — 60. Adult, Java, Reinwardt. — 61. Adult male, Java, Gadok Mountains, Bernstein, 1859. — 62, 63 and 64. Adult specimens, Java, Junghuhn, 1864. — 65 till 84. Males and females, West-Java, Diard, 1862. — 84 till 89. Males and females, Java. — 89. Adult specimen, Sumatra. Nos 59—90 have the lowerparts slaty

black, sometimes feebly reddish tinged, the pale side-stripe is very distinct or nearly imperceptible, the dark side-stripe is black, sometimes passing into the color of the back. — 90. Adult male, Java, Paris-Museum, 1868. Lowerparts pale red, side-stripe like back. — 91 and 92. Young specimens, Java, Reinwardt. — 93. Adult male, without label. Nos 91—94 have the upperparts and tail brownish red, dark side-stripe like back, underparts pale slaty yellow. — 94. Adult female, Java. Side-stripe like back. Hindmost part of body yellowish white, underparts greyish white. — 95. Adult male, Java (in spirits). — 96, 97 and 98. Young individuals, Java, Groen, 1861 (in spirits).

99 and 100. Skeletons, Java, Kuhl and v. Hasselt. — 101. Skeleton, without label. — 102. Skeleton, Sumatra, Deli, B. Hagen, 1882.

103. Skull of No 2. — 104. Skull of No 4. — 105. Skull of No 5. — 106. Skull of No 12. — 107. Skull of No 14. — 108. Skull of No 16. — 109. Skull of No 33. — 110. Skull of No 34. — 111. Skull of No 35. — 112. Skull of No 90. — 113. Skull, China, Canton, Witt. — 114. Skull, Malacca, Diard. — 115. Skull, Java, S. Müller, 1828. — 116. Skull, Java, Kuhl and v. Hasselt. — 117. Skull, Java. — 118, 119 and 120. Skulls of adult specimens, N. E. Sumatra, Deli, Tandjong Morawa, B. Hagen, 1882.

Sciurus microtis.

1879. *Sciurus* (*Rheithrosciurus*) *microtis* Jentink. Notes from the Leyden Museum. I. p. 41.
1881. *Sciurus microtis* Jentink. Notes from the Leyden Museum. III. p. 169.

Two upper premolars, the first is very good developed.

Hab. Saleyer-islands, lying south of Celebes.

Mounted specimens in the Leyden Museum:

1, 2, 3, 4, 5 and 6. Adult males and females, Saleyer-islands, Teysmann, 1878. Types of the species.
7. Skull of N⁰ 1.—8. Skull of N⁰ 2.—9. Skull of N⁰ 3.

C. Back with longitudinal stripes.

Sciurus insignis.

1820. *Sciurus insignis* Desmarest. Mammalogie. Supplément. p. 544.
1824. *Sciurus insignis* Horsfield. Zool. Res. in Java. Colored plate and description.
1878. *Sciurus insignis* Anderson. Yunnan Expedition. p. 262.

There are two upper premolars.

Hab. Sumatra, Borneo and Java. Malacca and China, Canton (fide Anderson. l. c. p. 263).

Mounted specimens in the Leyden Museum:
1. Adult male, Sumatra. — 2. Adult male, Borneo, Diard. Sides of the body and outside of legs red brown. — 3. Male, Borneo, Diard. — 4. Adult male, Java, S. Müller. — 5. Adult male, Java, Boie and Macklot. — 6 and 7. Young individuals, Java. Colored like N⁰ 2. — 8. Very young specimen, Java, Boie and Macklot. Haunches red.
9. Skull of N⁰ 2. — 10. Skull of an adult specimen, Java.

Sciurus sublineatus.

1838. *Sciurus sublineatus* Waterhouse. P. Z. S. L. p. 19.
1878. *Sciurus sublineatus* Anderson. Yunnan Expedition. p. 260.

There are two upper premolars. Ears not tufted.

Hab. Mountains of Southern India and Ceylon (Anderson. l. c.)

Mounted specimens in the Leyden Museum:
1. Adult specimen, Bengal, Mounts Ghats, Delessert.
2. Skull of N° 1. — 3. Skull of an adult specimen, Bengal, Delessert.

Sciurus berdmorei.

1849. *Sciurus berdmorei* Blyth. J. A. S. B. p. 603.
1878. *Sciurus berdmorei* Anderson. Yunnan Expedition. p. 261.

The number of upper premolars hitherto is unknown.

Hab. Southward through Martaban and Tenasserim to Cambodja and Cochin-China (Anderson. l. c.).

No specimens in the Leyden Museum.

Sciurus tristriatus.

1837. *Sciurus tristriatus* Charlesworth. Mag. Nat. Hist. p. 496 (Not seen by me).
1878. *Sciurus tristriatus* Anderson. Yunnan Expedition. p. 258; *Sciurus layardi* Anderson. l. c. p. 260.

Skeleton with 13 costales, 6 lumbares, 3 sacrales and about 20 caudales. There are two upper premolars. The pale bands or lines generally stop at certain distance of the base of the tail. I think it very probable that further investigations will prove that this species is synonymous with *Sciurus palmarum.*

Hab. Ceylon and Southern India, on the Nilgiris even as high as Ootacamund, it has also been obtained in Midnapore; and it ranges northward to the Himalaya (Anderson. l. c.).

Mounted specimens in the Leyden Museum:

1 till 9. Adult and young males and females, Ceylon, Colombo, Diard, 1859. — 9. Adult specimen, Colombo, Diard, 1859 (in spirits).

10. Skeleton of an adult specimen, Colombo, Diard, 1859.

11. Skull of an adult specimen, Colombo, Diard, 1859.

Sciurus palmarum.

1776. *Sciurus palmarum* Linnaeus. Systema Naturae. p. 186.
1878. *Sciurus palmarum* Anderson. Yunnan Expedition. p. 257.

There are two upper premolars. The pale lines or bands extend from the shoulder to the base of the tail. Skeleton with 12 costales, 7 lumbares, 3 sacrales and 25 caudales (Cuvier).

Hab. Bengal, north-west to the Punjab and southwards to Central India (Anderson. l. c.) and Ceylon (Leyden Museum).

Mounted specimens in the Leyden Museum:

1. Adult specimen, Hindoustan. Labeled *Sciurus palmarum* by Anderson. — 2. Female, Indian Continent, Zoological Garden at Amsterdam. — 3. Very young specimen, India. — 4. Adult male, Indian Continent, Frank. labeled *Sciurus layardi* by Anderson. It agrees in all respects with *Sciurus palmarum*, the only difference is that the general color is darker. — 5. Adult male, Bengal, Frank. Labeled *Sciurus tristriatus* by Anderson, although it differs by no means from N^0 4. — 6. Male, India. — 7. Male, Ceylon, Colombo, Diard, 1859. Labeled *Sciurus tristriatus*, var. *ruficeps* by Anderson; the same author wrote upon the label: »very different *voice* from

palmarum." I see no difference whatsoever between this specimen and the true *palmarum*. The head of it is not redder colored than that part in N°s 4 and 5.

8. Skull of N⁰ 2.

Sciurus mcclellandii.

1839. *Sciurus McClellandii* Horsfield. P. Z. S. L. p. 152.
1878. *Sciurus maclellandi* Anderson. Yunnan Expedition. p. 263.

There are two upper premolars.

Hab. From Nepal and Tibet to the east of China and Formosa, and through Assam and Cachar south-eastward to Tenasserim and Siam (Anderson. l. c.).

Mounted specimens in the Leyden Museum:

1 and 2. Adult males, China, Tingchow, Swinhoe, October 1867. — 3, 4 and 5. Adult specimens, Formosa, Swinhoe, March and April 1862. — 6, 7 and 8. Adult specimens, Formosa, Verreaux. — 9. Adult individual, Nepal, Hodgson. — 10. Adult male, Burma, Tongho, Lord Walden, 1869. — 11 and 12. Adult males, Malacca, Diard, May and December.

13. Skull of N⁰ 7. — 14. Skull of N⁰ 9.

RHEITHROSCIURUS.

Rheithrosciurus macrotis.

1856. *Sciurus macrotis* Gray. P. Z. S. L. p. 341. pl. XLVI.
1867. *Rheithrosciurus macrotis* Gray. Ann. and Mag. Nat. Hist. p. 272.
1878. *Sciurus* (*Rheithrosciurus*) *macrotis* Anderson. Yunnan Expedition. p. 277.
1881. *Rheithrosciurus macrotis* Jentink. Notes from the Leyden Museum. Vol. III p. 169.

There is only a single upper premolar.

Hab. Borneo, Sarawak.

No specimen in the Leyden Museum.

RHINOSCIURUS.

Rhinosciurus laticaudatus.

1839—44. *Sciurus laticaudatus* Müller and Schlegel. Verhandelingen over de natuurlijke Geschiedenis etc. Zoologie. p. 100. Pl. 15, figs 1—3.
1843. *Rhinosciurus Tupaioides* Gray. List of the specimens etc. p. 195.
1867. *Rhinosciurus tupaoides* Gray. Ann. and Mag. Nat. Hist. p. 286.
1878. *Sciurus* (*Rhinosciurus*) *tupaoides* Anderson. Yunnan Expedition. p. 274.
1881. *Rhinosciurus laticaudatus* Trouessart. Catalogue des Rongeurs vivants et fossiles. p. 18.

Although Anderson has examined the types of *Sciurus laticaudatus* and *Rhinosciurus tupaioides* (l. c. p. 276) and found that they belong to only one species, he gives to the species the specific title *tupaoides* (lege *tupaioides*) Gray and not the elder title *laticaudatus* Müller and Schlegel; I will not specify such an unjust and unscientific act, but pass over it in silence. Transiently it must be observed that Prof. Schlegel never has travelled in the Indian Archipelago, as Anderson seems to believe (see also p. 262), for instance Anderson writes, l. c. p. 276: »Müller and Schlegel met with it (viz: with *Sciurus laticaudatus*) in that island (viz: in Borneo), along the banks of the rivers (lege: river) Barito or Doeson and in the mountain jungle." Remarkably enough S. Müller and Schlegel stated that this species has *not* been found along the banks of the river Baritto or Doeson and that its distribution consequently seems to be very restrict!

I add to the observations made by Müller and Schlegel, Milne Edwards and Anderson that in this species the two upper premolars and also the lower one are remarkable in account of their large size and that the skeleton presents 12 costales, 7 lumbares, 2 sacrales and about 22 caudales.

Hab. Borneo and the Malayan Peninsula.

Mounted specimens in the Leyden Museum:
1. Adult female, W. Borneo, Pontianak, Diard, 1827. The type of the species. — 2 and 3. Adult males, Pontianak, Diard, 1827.
4. Skeleton of N° 1.
5. Skull of N° 2.

AFRICAN SQUIRRELS.

As to the African Squirrels I refer to my Monograph of that group, published in the »Notes from the Leyden Museum, 1882. p. p. 1—53." I only add the acquisitions received since that publication.

Sciurus annulatus Desmarest.
14. Adult female, Senegal, H. von Maltzan, 1881 (in spirits).

Sciurus poensis Smith.
15 and 16. Male and female, Gold-Coast, Elmina, v. d. Bossche, 1861 (in spirits).

Sciurus pyrropus Cuvier.
23. Skull, Gold-Coast, Nagtglas, 1861.

Xerus erythopus Et. Geoffr. St. Hilaire.
23. Adult female, Liberia, Grand Cape Mount, 10 August 1881, Büttikofer. — 24. Young specimen, Senegal, H. von Maltzan, 1881 (in spirits).
25. Skull of N° 23.

RECAPITULATION.

American Squirrels.	Mounted skins.	Spirits.	Skeletons.	Skulls.
1. *Sciurus hudsonius* Pallas.	12			5.
2 » *fossor* Peale.	7			3
3. » *niger* Catesby.	13			2
4. » *aberti* Woodhouse.	2			2
5. » *carolinensis* Gmelin.	21			10
6. » *variegatus* Erxleben.	39			10
7. » *stramineus* Eudoux.	2			2
8. » *variabilis* Is. Geoffroy.	21			7
9. » *chrysuros* Pucheran.	4			3
10. » *aestuans* Linnaeus.	16		1	6
	137		1	50
European and Asiatic Squirrels.				
1. *Sciurus indicus* Erxleben.	4		1	2
2 » *giganteus* McClelland.	3			1
3. » *bicolor* Sparrmann.	16		2	4
4. » *albiceps* Desmarest.	29			8
5. » *zeylanicus* Ray.	7			2
6. » *vulgaris* Linnaeus.	31	1	1	1
7. » *lis* Temminck.	3			2
8. » *syriacus* Ehrenberg.	11		1	4
9. » *alstoni* Anderson.				
10. » *hippurus* Is. G. St. Hilaire.	7			1
11. » *erythraeus* Pallas.	7			2
12. » *lokroides* Hodgson.	4			3
13. » *lokriah* Hodgson.	2			1
14. » *pernyi* A. Milne Edwards.				
15. » *davidianus* Milne Edwards.	1			1
16. » *caniceps* Gray.	5			4
17. » *atrodorsalis* Gray.	6			1
18. » *quinquestriatus* Anderson.				
19. » *castaneoventris* Gray.	3			1
Transport.	139	1	5	38

	Mounced skins.	Spirits.	Skelet-ons.	Skulls.
Transport . .	139	1	5	38
20. *Sciurus pygerythrus* Is. G. St. Hilaire.	4			1
21. » *diardii* Jentink.	1			1
22. » *tenuis* Horsfield.	15			1
23. » *murinus* Müller a. Schlegel.	5			3
24. » *exilis* Müller.	6	1	1	1
25. » *rubriventer* Müller a. Schlegel.	6			1 1
26. » *rosenbergii* Jentink . . .	14			6
27. » *steerii* Günther.				
28. » *leucomus* Müller and Schlegel.	16		2	7
29. » *soricinus* Waterhouse. . .	12		1	5
30. » *prevostii* Desmarest . . .	29			5
31. » *plantani* Ljung.	94	4	4	18
32. » *microtis* Jentink	6			3
33. » *insignis* Desmarest. . . .	8			2
34. » *sublineatus* Waterhouse. .	1			2
35. » *berdmorei* Blyth				
36. » *tristriatus* Charlesworth .	8	1	1	1
37. » *palmarum* Linnaeus. . .	7			1
38. » *mcclellandii* Horsfield. . .	12			2
39. *Rheithrosciurus macrotis* Gray. .				
40. *Rhinosciurus laticaudatus* Müller and Schlegel.	3		1	1
	386	7	15	99

African Squirrels.

1. *Sciurus stangeri* Waterhouse. . .	11			7
2. » *ebii* Temminck.	2			2
3. » *aubinnii* Gray.	6			3
4. » *rufo-brachiatus* Waterhouse.	18			6
5. » *palliatus* Peters. . . .				
Transport. .	37			18

	Mounted skins.	Spirits.	Skelet-ons.	Skulls.
Transport . .	37			18
6. *Sciurus mutabilis* Peters. . . .				
7. » *shirensis* Gray.				
8. » *punctatus* Temminck. . .	10	2		5
9. » *annulatus* Desmarest. . .	10	1		3
10. » *cepapi* Smith.	3			2
11. » *poensis* Smith.	12	2		2
12. » *minutus* Du Chaillu. . .				
13. » *pyrropus* F. Cuvier. . .	15	3		5
14. » *congicus* Kuhl.	2			1
15. » *lemniscatus* Le Conte. . .	2			2
16. » *getulus* Gessner	2			1
17. *Xerus rutilus* Cretzschmar . . .	5			5
18. » *erythopus* E. G. St. Hilaire.	15	3	1	6
19. » *capensis* Kerr	2			2
	115	11	1	52

American Squirrels	137		1	50
Asiatic and European Squirrels. .	386	7	15	99
African Squirrels.	115	11	1	52
	638	18	17	201